8 POTENTIAL DATA GAPS

This section presents potential data gaps identified during review of the RI data presented in this report. These potential data gaps were then considered in the context of the results of the risk assessments summarized in **Section 7.0** to evaluate if filling the data gap is necessary to further characterize the nature and extent of *risks* in the OU3 Study Area, or if filling the data gap is necessary in order to adequately evaluate the feasibility of remedial alternatives in the FS. The need to fill any of the potential data gaps discussed below will be further evaluated as part of the OU3 Study Area FS.

The potential data gap summary below is organized by non-asbestos constituents and LAA in the various media to align with the presentation of the nature and extent of contamination in **Section 5.0**.

8.1 Potential Non-Asbestos Data Gaps

8.1.1 Surface Water

A potential data gap associated with evaluating the nature and extent of non-asbestos constituents in surface water may be that sufficient data were not collected during different flow conditions to fully evaluate if constituent concentrations vary in relation to flow rate. Phase I and II data were collected in an attempt to capture fall, spring, and summer time periods (including both high and low flow conditions). However, the data set is not sufficient to fully evaluate variability of constituent concentrations in relation to flow rate at all areas within the site. However, as discussed in **Section 5.1.1.2**, the available data were considered suitable for evaluating risks, and the conclusions of the risk assessments were that the non-asbestos constituents in surface water in the OU3 Study Area do not pose unacceptable risks to human health or the environment (see **Sections 7.4. and 7.5**). As a result, the nature and extent of non-asbestos constituents in surface water in the OU3 Study Area is considered adequately defined and additional evaluations of non-asbestos constituents in surface water are not considered necessary at this time.

8.1.2 Groundwater

Potential data gaps associated with the evaluation of non-asbestos constituents in groundwater include:

- The sampled wells were not installed and constructed with the objective of collecting environmental samples. However, based on the well rehabilitation efforts described in **Section 2.7.1** and the known well construction information, the groundwater analytical results are considered adequate for evaluating the nature and extent of non-asbestos constituents in groundwater.
- There are no reliable reference groundwater data (i.e., data from locations presumed to be un-impacted by previous mining activities or the presence of mine wastes) to compare with the inorganic, non-asbestos groundwater data collected from the OU3 Study Area. Comparing OU3 Study Area data with reference data would provide a line-of-evidence for identifying inorganic, non-asbestos constituents that may be elevated in groundwater as a result of previous mining activities or existing mine waste.

However, the available groundwater data were considered suitable for evaluating risks, and the conclusions of the risk assessments were that the non-asbestos constituents in groundwater in the OU3 Study Area do not pose unacceptable risks to human health or the environment (see **Section 7.4**). Moreover, the results of the detected non-asbestos constituents in the available groundwater samples summarized in **Section 5.1.3** do not indicate that previous mining activities or the presence of mine waste have had a significant impact on groundwater. As a result, the nature and extent of non-asbestos constituents in groundwater in the OU3 Study Area is considered adequately defined and additional evaluations of non-asbestos constituents in groundwater are not considered necessary at this time.

8.1.3 Sediment

A potential data gap associated with evaluating the nature and extent of non-asbestos constituents in sediment may be that no samples were collected at depths that can be used to evaluate the vertical extent of non-asbestos constituents deeper than six inches bgs. Another potential data gap is that the volumes of sediments in the streams and ponds with elevated non-asbestos-constituent concentrations is not known. However, as discussed in **Section 5.1.4.3**, the available data were considered suitable for evaluating risks, and the conclusions of the risk assessments were that the non-asbestos constituents in sediment in the OU3 Study Area do not pose unacceptable risks to human health or the environment (see **Sections 7.4** and **7.5**). As a result, the nature and extent of non-asbestos constituents in sediment in the OU3 Study Area is considered adequately defined and additional evaluations of non-asbestos constituents in sediment are not considered necessary at this time.

8.1.4 Soil/Mine Waste

A potential data gap associated with evaluating the nature and extent of non-asbestos constituents in soil/mine waste may be that not all samples were analyzed for SVOCs/PAHs or the full suite of VOCs. Another data gap may be that the soil/mine waste samples were not collected at depth, so there are no data regarding the potential vertical extent of mine-related non-asbestos impacts. However, as discussed in **Section 5.1.1.3**, the available data were considered suitable for evaluating risks, and the conclusions of the risk assessments were that the non-asbestos constituents in soil/mine wastes in the OU3 Study Area do not pose unacceptable risks to human health or the environment (see **Sections 7.4** and **7.5**). As a result, the nature and extent of non-asbestos constituents in soil/mine waste in the OU3 Study Area is considered adequately defined and additional evaluations of non-asbestos constituents in sediment are not considered necessary at this time.

8.2 Potential LAA Data Gaps

8.2.1 Lack of Representative LAA Background Data in the OU3 Study Area

As discussed in **Section 2.6.1**, EPA conducted an investigation at the Libby Site to characterize LAA in soil from areas that were thought to be representative of background conditions. The investigation was presented in the document titled: *Final Background Soil Summary Report Libby Asbestos Superfund Site, Montana* (CDM Smith, 2014b). The primary conclusion of the report was that there is a non-zero level of LAA in soils within the Kootenai Valley that is not attributable to vermiculite mining and processing activities at the Libby Site. The average total LAA concentration in background soil was estimated to be approximately 0.014% by mass. However, while these estimates may be representative of background conditions within the Kootenai Valley,

they likely are not representative of background conditions within the OU3 Study Area. This is because of the unique natural geologic character of Vermiculite Mountain (i.e., a large, high-quality vermiculite ore body containing high percentages of fibrous and asbestiform amphiboles), which was the reason the site was mined. As a result, it can be inferred that background LAA concentrations within the OU3 Study Area (i.e., proximal to Vermiculite Mountain) would be higher than the more distal surrounding areas where the EPA conducted the background study. However, the true nature of background LAA concentrations in the OU3 Study Area has not been established. Background levels for several media would be very difficult to establish and discerning the source (e.g., naturally occurring or anthropogenic) of the LAA adds additional complexity to the evaluation. The need to address this data gap will be assessed in the FS.

8.2.2 Soil, Mine Waste, and Bedrock

The extent of LAA-impacted forest soils between sample points is a potential data gap. However, the extent of LAA-impacted forest soils was interpolated between sample points. A limitation of this interpolation is that soils between sampling points may have lower levels of LAA, because the higher levels of LAA would be located at the base of trees where shed bark and duff are located before degrading into soils. Because TEM analyses of bark and duff are a more sensitive metric of LAA presence compared to PLM-VE analyses of forest soil, additional measurements of LAA in forest soil by PLM-VE are not deemed necessary.

Other than a few samples collected during the test pit investigation, the bulk of the solid media samples were collected near the ground surface. Accordingly, the vertical extent of LAA impacts in Former Mine Area soils is a potential data gap. However, elevated, naturally occurring LAA levels are expected to be present throughout the pyroxenite bedrock which underlies the soils and other media in the Former Mine Area.

Although extensive roadway material sampling has been performed within the Former Mine Area, there are no data for unpaved roads within approximately two to four miles from the center of the mine. Because many of these roads may have used gravel from local pits, additional data may be necessary to characterize LAA concentrations in roadway materials.

8.2.3 Groundwater

One possible data gap with regards to LAA concentrations in groundwater is that no groundwater wells were located to the northeast of the Former Mine Area. However, groundwater conditions are anticipated to be the same in these areas as in the areas investigated. In addition, groundwater likely flows towards, and discharges into, Fleetwood Creek in this area, which in turn flows directly into the KDID impoundment.

8.2.4 Surface Water and Sediment

A potential data gap associated with evaluating the nature and extent of LAA in surface water may be that additional temporal surface water sample data samples need to be collected during high flow periods in select areas in order to more definitively establish that LAA concentrations are influenced by flow conditions. However, as discussed throughout **Section 5.2.4**, the available data are considered suitable and sufficient for performing the Phase 2 FS.

Another potential data gap related to surface water is that the depth and volume of the LAA-impacted ponds in the OU3 Study Area are not known. The necessity of filling this data gap will be evaluated in the FS.

The current presence and extent of wetlands and jurisdictional waters within the OU3 Study Area that could be potentially impacted by a future remedy is currently unknown. The field work for this evaluation was conducted in the Spring of 2016.

A potential data gap associated with evaluating the nature and extent of LAA in sediment is the need for additional sediment data along the overbank of the Kootenai River to better evaluate the extent of potential LAA impacts along the Kootenai River. However, 20 sediment samples have been collected within the Kootenai River between Troy and the southeastern edge of the OU3 Study Area, 17 of which were Bin B1 or Bin B2 (trace; detected LAA <1%); the remainder were ND. The data were considered sufficient for preparation of the human health risk assessment (EPA, 2015a). The need for additional sediment investigation to evaluate whether remedial action may be necessary to mitigate potential future exposures will be determined during the FS.

8.2.5 Tree Bark and Duff Material

The extent of LAA-impacted tree bark and duff between sample points is a potential data gap. However, sufficient data were collected in order to interpolate between sample points. However, additional data on LAA levels in tree bark and duff may be necessary to refine this interpolation between tree bark and duff data points.

Establishing temporal LAA data patterns in tree bark and duff may be important for evaluating the feasibility of remedial alternatives. However, insufficient data were collected to establish temporal LAA data patterns, and significant temporal changes were not expected during the time frame of this investigation.

8.2.6 Ambient Air

Ambient air data were collected during three events. It is believed that sufficient data have been collected to support the findings of the RI. Further, sufficient data were collected to support the preparation of the *Final LAA HHRA* (EPA, 2015a), and estimated risks (refer to **Section 7.0**) indicate exposures to outdoor ambient air concentrations at the levels detected at the OU3 Study Area do not pose a significant risk to human health.

8.2.7 ABS Potential Data Gaps

Risk estimates (refer to **Section 7.0**) indicate commercial logging risks (skidding and site restoration scenarios) are above a level of concern near the mine (within two miles from the center of the Former Mine Area) and below a level of concern at an intermediate distance (approximately four miles) from the center of the Former Mine Area. Additional commercial logging ABS data need to be collected in intermediate areas (two to four miles from the center of the Former Mine Area) in order to better define the point at which risks become acceptable within this area.

Risk estimates (refer to **Section 7.0**) indicate a resident emptying woodstove ash after burning firewood collected from within approximately one mile from the mine center are above a level of concern and below a level of concern using firewood from Flower Creek and Bear Creek, which are located south of Libby (i.e., far from the mine). Because the risk estimates indicate

disturbances of woodstove ash risks are above a level of concern when firewood is collected near the mine, ABS data may need to be collected in intermediate areas in order to better define the point at which risks become acceptable within the OU3 Study Area.

Due to the inherent danger associated with fire ABS activities (e.g., slash pile and prescribed burns) only limited events have been performed. Additional tree bark and duff data are anticipated, along with modeling activities, to predict areas where potential exposures would result in unacceptable risk.

The majority of ABS investigations for the OU3 Study Area have been conducted in locations downwind (northwest) of the mine. The lack of ABS data in upwind/crosswind locations is a potential data gap. Additional tree bark and duff data is anticipated, along with modeling activities, to predict areas where potential exposures would result in unacceptable risk.

Data on LAA in smoke from a high-intensity fire has not been collected and may be necessary to better define exposure to firefighters. However, it may not be practicable to perform high-intensity fire sampling. Therefore, data from the low-intensity burn testing will be utilized for the FS evaluations.

9 SUMMARY AND CONCLUSIONS

A Remedial Investigation was performed at the OU3 Study Area within the Libby Asbestos Superfund Site between 2007 and 2015. The OU3 Study Area encompasses a former vermiculite mine, historically known as Vermiculite Mountain, and the areas adjoining the mine. The former vermiculite mine began limited operations in the 1920s and was operated on a larger scale by Grace from approximately 1963 to 1990. Vermiculite from the mine contains amphibole-type asbestos, referred to as LAA.

The purpose of the OU3 Study Area RI was to:

1. characterize the nature and extent of potential impacts within the OU3 Study Area resulting from historical mining, milling, and activities ancillary to mining and milling,
2. describe the fate and transport of these potential constituents,
3. provide information relevant to the assessment of human and ecological risks, and
4. obtain data to support the evaluation of remedial alternatives in the FS.

Media sampled as part of the RI to date included surface water, groundwater, sediment, sediment pore water, soil, mine waste, tree bark, forest soil, duff material, fish and game tissues, ash, ambient air, and ABS air. The various media have been analyzed for LAA and other non-asbestos constituents that potentially could have been released to the environment as a result of mining activities. A summary of the RI findings by media is presented below, along with conclusions.

9.1 Surface Water and Sediment

Former Mine Area Drainages. Several organic and inorganic non-asbestos constituents were detected in the OU3 Study Area surface water and sediment samples. Some of the constituents are likely elevated in concentration due to the geology in the vicinity of the Former Mine Area. The non-asbestos risk assessments concluded that non-asbestos constituents in surface water and sediment do not pose unacceptable risks to human health and the environment.

LAA has been detected in surface water at levels above the MCL in Fleetwood Creek Pond (FC-Pond), Carney Creek (CC-2; near the confluence with LRC), seeps (at the base of the waste rock piles), and in various locations along LRC, with maximum concentrations detected at LRC-6 (near the mouth of Rainy Creek). Elevated LAA in surface water was typically measured between the months of April and May. The higher LAA concentrations were typically observed to be associated with higher flows and steeper gradients, which led to increased energy and erosion. Higher LAA concentrations also may be associated with run-off from LAA-impacted media.

LAA was detected in the majority of sediment samples collected from the creek and pond sampling locations near the Former Mine Area, with the highest levels (up to 10%) measured in Carney Pond and in LRC (TP-TOE2; located south of the KDID). Contributions of LAA from naturally occurring surficial geologic materials (bedrock and glacial material) and contact with mine waste materials appear to be contributing to LAA in sediment and surface water. LAA appears to accumulate in pond sediment due to a reduction in stream velocity, which allows the suspended LAA to settle. During increased surface water flow events (e.g. storm events), re-suspension of LAA in sediments could potentially increase LAA concentrations in surface water.

As concluded in the *Final Asbestos BERA*, the weight of evidence suggests that LAA in waters of LRC is not causing adverse effects on resident trout. LAA in LRC may be causing small to

moderate effects on survival of some species, but that the overall benthic macroinvertebrate community is not substantially impacted. Sediments and waters in the OU3 Study Area are not likely to be causing any ecologically significant adverse effects on amphibian populations given a lack of overt signs of toxicity.

Kootenai River. There were no exceedances of the MCL in any of the surface water samples analyzed; and the highest concentration of LAA in sediment samples was Bin B2 (≥0.2% to <1%); these LAA levels were measured downstream of LRC and at several locations near and downstream of Libby and Troy. There appears to be very little accumulation of LAA in sediment near the mouth of LRC, which indicates that contribution of LAA to the Kootenai River from LRC is not substantial. There are a number of other potential sources of LAA within the Libby Site boundary (OU1, OU2, former river conveyor system, riprap in creeks, and natural material) that are not associated with the OU3 Study Area. The human health risk assessment performed for the Libby Site found no significant risks associated with recreational activities that may disturb LAA in Kootenai River sediments under current conditions (EPA, 2015a). However, if Kootenai River sediments were to become exposed and dry in the future, such as during an extended drought event or a dredging scenario where sediments are placed in accessible areas and allowed to dry out, additional evaluations of Kootenai river sediments may be necessary to determine whether these sediments pose an unacceptable risk.

9.2 Groundwater

The overall RI data suggests that groundwater has not been significantly impacted by previous mining activities or existing mine wastes with respect to non-asbestos constituents. The non-asbestos human health risk assessment concluded that ingestion of non-asbestos constituents in groundwater do not pose unacceptable risks to human health.

With respect to LAA, of the 20 samples collected from eight shallow well/piezometer locations, only two samples contained concentrations of LAA greater than the MCL; both are attributed to sediment (due to insufficient development) in the piezometers. Given the low seepage velocity and natural filtration that typically occurs in porous media, it is expected that very little transport of LAA would occur within the shallow groundwater. In addition, LAA was not detected above the MCL in bedrock groundwater samples. Thus, the RI data suggest that groundwater has not been significantly impacted by previous mining activities or existing mine wastes with respect to LAA. The *Final LAA HHRA* concluded that risk from ingestion of LAA in groundwater from wells within the OU3 Study Area is of low concern.

9.3 Soil, Mine Waste, and Bedrock

Several inorganic, non-asbestos constituents exceeded the Montana background threshold concentrations in soil in the OU3 Study Area and reference sample locations; and several inorganic, non-asbestos constituents were found to be elevated relative to the reference locations. These results are consistent with the mineralogy of the OU3 Study Area. The presence and distribution of SVOCs/PAHs and VOCs in soil/mine waste in the OU3 Study Area are not significant or widespread.

LAA concentrations in naturally occurring materials ranged from ND (Bin A) to ≥1% (Bin C) in the glacial materials, and were as high as 8% in the pyroxenite bedrock samples. In general, the highest percentages of LAA reported in samples were from road soil (25%, collected on a mine bench), bedrock (8%, outcrop sample), waste rock (5%), and coarse tailings (4%). The extent of

detected LAA in soil, mine waste, and bedrock samples ≥0.2% by mass extends over an area of approximately 1,544 acres, although LAA was detected at levels below 0.2% beyond this area. The only forest soil samples with detections of LAA were collected within approximately two miles from the center of the Former Mine Area. Approximately 40.7 MCY of waste rock, 3.2 MCY of fine tailings, and 14.7 MCY of coarse tailings are present in the Former Mine Area.

9.4 Tree Bark, Duff Material, Ash and Smoke

The mean PCME LAA levels for the near (within two miles from the center of the Former Mine Area), intermediate (between two and six miles from the center of the Former Mine Area), and far (more than six miles from the center of the Former Mine Area) tree bark data groupings were 0.70 Ms/cm^2, 0.22 Ms/cm^2, and 0.049 Ms/cm^2, respectively. The mean PCME LAA levels for the near, intermediate, and far duff data groupings were 141 Ms/g-dw, 23 Ms/g-dw, and 1.2 Ms/g-dw, respectively. These data indicate LAA levels in tree bark and duff material tend to decrease with increasing distance from the Former Mine Area. The highest LAA levels are generally within 3-4 miles of the mine center. Results of controlled burn tests using LAA-impacted duff and firewood from the OU3 Study Area indicate the majority (>90%) of the LAA fibers present in the media that is burned do not become entrained in air emissions, but are retained in the ash. Potential human health exposures from disturbances of tree bark, duff material, and ash were evaluated through the collection of ABS air (see **Section 9.7**).

As concluded in the *Final Asbestos BERA*, the weight of evidence suggests LAA exposures are not causing any ecologically significant effects on populations of terrestrial ecological receptors (e.g., mammals and birds) residing in the forest areas of the OU3 Study Area.

9.5 Ambient Air

Ambient air sampling was conducted during various conditions to assess whether LAA fibers would become airborne due to wind disturbance, in conditions that closely represented typical wind conditions at the OU3 Study Area. Results showed that PCME LAA levels in ambient air ranged from ND to 0.0056 s/cc. The *Final LAA HHRA* concluded that exposures to outdoor ambient air concentrations of LAA at the levels detected at the OU3 Study Area do not pose a significant risk to human health.

9.6 Tissues

LAA fibers were present in the fillet tissues of fish collected from the Mill Pond, but LAA was not detected in any muscle or organ tissues of a mule deer that was hunted from within the OU3 Study Area. The *Final LAA HHRA* concluded that risk from ingestion of LAA in fish and game tissues derived from the OU3 Study Area is of low concern. Additionally, the *Final Asbestos BERA* concluded that ecological receptors in OU3 are unlikely to be adversely impacted by LAA or non-asbestos constituents released to the environment by previous vermiculite mining and milling activities.

9.7 ABS and Human Health Risk Assessment

ABS involves the collection of air samples under scripts describing a variety of vigorous source-disturbance conditions that are designed “to result in air concentrations that are at the high end of what could occur” (EPA, 2008g). These air concentrations provide high-end estimates of

potential inhalation exposure concentrations that can be used to conservatively calculate potential risks.

Air samples collected from ABS performed in the OU3 Study Area were used to provide high-end estimates of potential inhalation exposure concentrations to evaluate potential human health risks. In total, more than 150 different exposure scenarios were evaluated in the *Final LAA HHRA.* The exposure scenarios, exceeding an HQ of 1 related to the OU3 Study Area are presented below and on **Figure 7-1**.

- Outdoor worker exposures during commercial logging activities in OU3 near the mine (approximately 1 mile from the Former Mine Area center), especially those logging activities that disturb soil and duff material (e.g., skidding, site restoration) (HQ=2 for site restoration; HQ=5 for skidding);
- Firefighter exposures while performing dry (as opposed to wet) mop-up activities after an understory burn that occurs near the mine (approximately 1 mile from the Former Mine Area center) (HQ=5);
- Forest worker exposures while building slash piles near the mine (approximately 1 mile from the Former Mine Area center) (HQ=2);
- Trespasser rock hound exposures in the disturbed area of the mine in OU3 (HQ=2); and
- Residential exposures (outside of OU3 Study Area) during woodstove ash disturbances (i.e., while emptying ash from the woodstove) when the burned firewood is sourced from near the mine (approximately 1 mile from the Former Mine Area center) (HQ=2).

The cumulative risk calculations demonstrate:

- People who are predominantly exposed at locations where lower LAA levels in source media (e.g., forest fire worker building slash piles at distances greater than 1 mile from the Former Mine Area center, outdoor worker firefighter during simulated burning activities) are likely to have cumulative risks that are below a level of concern, even when the cumulative scenario includes many different exposure activities across multiple OUs.
- Cumulative exposure and risk can be reduced by changing the locations where the activities are performed (e.g., collecting firewood from areas far from the mine site).
- Cumulative exposure has the potential to become significant if the majority of the receptor lifetime is spent at properties and in locations where LAA is present and where people are engaging in source disturbance activities that have a high potential for LAA releases.
- When cumulative exposure includes scenarios where LAA-contaminated source materials are disturbed, such as trespassing on the disturbed area of the mine site, disturbing surface soils with Bin B2/C concentrations, performing certain activities related to commercial logging operations near the mine site, disturbing vermiculite insulation during tradesperson activities, or disturbing subsurface soils with residual LAA contamination, these exposures may be important risk drivers for cumulative risk estimates. EPA defines a risk driver as an individual exposure scenario that contributes a substantial fraction of the cumulative risk (EPA, 2015a).

- It is not necessary to address every single exposure scenario to significantly lower cumulative HIs. Addressing exposures for the risk drivers will have the greatest impact in lowering cumulative exposures and risks.

9.8 Summary of Data Gaps to be Potentially Addressed in the OU3 Study Area Feasibility Study

This section presents a summary of potential data gaps discussed in **Section 8.0** that potentially should be filled to support the FS**.** The need to fill any of the potential data gaps will be addressed in the OU3 Study Area FS.

- **Soil and Mine Waste.** Although extensive roadway material sampling has been performed within the Former Mine Area, there are no LAA data for unpaved roads within approximately two to four miles from the mine. Because many of these roads may have used gravel from local pits, additional data may be necessary to characterize LAA concentrations in roadway materials.
- **Woodstove Ash.** Risk estimates (refer to **Section 7.0**) indicate a resident emptying woodstove ash after burning firewood collected from within approximately one mile from the mine center are above a level of concern and below a level of concern using firewood from Flower Creek and Bear Creek, which are located south of Libby. ABS data may need to be collected in intermediate areas (two to four miles) from the center of the Former Mine Area in order to better define the point at which risks become acceptable within the OU3 Study Area.
- **Surface Water.** The depth and volume of the LAA-impacted ponds in the OU3 Study Area are currently not known. It may be necessary to fill this data gap during the FS in order to evaluate remedial alternatives.
- **Sediment.** The depth and volume of LAA-impacted sediment in ponds and streams in the OU3 Study Area are not currently known. It may be necessary to fill this data gap during the FS in order to evaluate remedial alternatives. In addition, it may be necessary to collect additional sediment data along the Kootenai River during the FS to ensure appropriate controls are in place to address potential future sediment exposure scenarios.
- **ABS Air during Commercial Logging Activities.** Risk estimates indicate commercial logging risks (skidding and site restoration scenarios) are above a level of concern near the center of the Former Mine Area and below a level of concern at an intermediate distance (approximately four miles) from the center of the Former Mine Area. Additional commercial logging ABS data may need to be collected in intermediate areas (two to four miles) from the center of the Former Mine Area in order to better define the point at which risks become acceptable within the OU3 Study Area.
- **ABS Air during a Wildfire.** Data on LAA in smoke from a high-intensity fire have not been collected and may be necessary to better define exposure to firefighters. However, it may not be practicable to perform high-intensity fire sampling. Therefore, data from the low-intensity burn testing will be utilized for the FS evaluations.
- **Tree Bark and Duff Material.** Additional data on LAA levels in tree bark and duff may be necessary to refine the interpolation between sampling points. Establishing temporal LAA data patterns in tree bark and duff may also be important for evaluating the feasibility of remedial alternatives.

9.9 Conclusions

The data analysis performed for this report concluded that LAA is the only contaminant of concern for the OU3 Study Area. The *Final Asbestos BERA* concluded that aquatic and terrestrial ecological receptors are unlikely to be adversely impacted by LAA. Thus, humans are the only receptor of concern. The *Final LAA HHRA* concluded that the primary exposure media to LAA within the OU3 Study Area is outdoor air during certain activities that disturb various source media (e.g., soil, duff material, ash) and the exposure pathway of greatest concern is inhalation by persons conducting those activities.

The nature and extent of LAA in the OU3 Study Area is considered to be adequately defined, with the exception of the data gaps identified, based upon the data analysis performed for this report. The available data are considered suitable and sufficient for initiating the FS, although additional characterization activities are anticipated to refine remedial areas. The OU3 boundary for purposes of the FS and remedy implementation is currently under development.

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